Monocyclone
EZ04
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About this instructions

General information

This operating manual contains all important information you will need to work with the EZ04. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the functional mode of the individual system components should be referenced in the respective enclosed documents.

Keeping the Manual

Please keep this Manual ready for later use or if there should be any queries.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the Gema operating instructions. The general safety precautions must also be followed as well as the regulations in the relevant operating instructions.

⚠️ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠️ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠️ CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
ATTENTION
Indicates a potentially harmful situation which, if not avoided, the equipment or something in its surrounding may be damaged.

ENVIRONMENT
Indicates a potentially harmful situation which, if not avoided, may have harmful consequences for the environment.

MANDATORY NOTE
Information which must be observed.

NOTE
Useful information, tips, etc.

Presentation of the contents

Figure references in the text
Figure references are used as cross references in the descriptive text.
Example:
"The high voltage (H) created in the gun cascade is guided through the center electrode."
Safety

Basic safety instructions

- This product is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.

- Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. If this product is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.

- Start-up (i.e. the execution of intended operational tasks) is forbidden until it has been established that this product has been set up and wired according to the guidelines for machinery. The standard "Machine safety" must also be observed.

- Unauthorized modifications to the product exempt the manufacturer from any liability from resulting damage.

- The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.

- Furthermore, the country-specific safety regulations also must be observed.

Product specific security regulations

- This product is a constituent part of the equipment and is therefore integrated in the system's safety concept.

- If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.

- The installation work to be done by the customer must be carried out according to local regulations.

- It must be ensured, that all components are earthed according to the local regulations before start-up.

For further security information, see the more detailed Gema safety regulations!
WARNING

Working without operating instructions

Working without operating instructions or with individual pages from the operating instructions may result in damage to property and personal injury if relevant safety information is not observed.

– Before working with the device, organize the required documents and read the section "Safety regulations".
– Work should only be carried out in accordance with the instructions of the relevant documents.
– Always work with the complete original document.
Product description

Intended use

The EZ04 Monocyclone (as a matter of principle a centrifugal cyclone) separates the coating powder from the booth exhaust air.

Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. This product should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.

Any other use is considered non-compliant. The manufacturer is not responsible for any incorrect use and the risks associated with such actions are assumed by the user alone!

For a better understanding of the interrelationships in powder coating, it is recommended that the operating instructions for all other components be read as well, so as to be familiar with their functions too!

Reasonably foreseeable misuse

- Operation without the proper training
- Use of enameled powder
- Use with insufficient compressed air quality

Design and function

The volume of exhaust air, depending on the booth size, the number of guns etc. is created by a fan fitted after the monocyclone and a filter separator. The powder/air mixture arrives at the cyclone through the ducting and the tangential air input. Now the powder is set in rotation, separated from the air by the centrifugal force and isolated around the cyclone wall. The exhaust air rises up through the central immersion tube in the cyclone and arrives at the filter separator. Herein, the residual powder is retained and the cleaned air is returned into the workshop environment.
**fig. 1:**

1. Exit chamber  
2. Powder/air entry (from the booth)  
3. Pinch valve (Dense phase conveyor)  
4. Pivoted delivery unit  
5. Powder pump  
6. Air outlet

**Delivery unit**

The separated powder is removed from the operating cyclone by the pivoted delivery unit. The delivery unit, consisting of the cyclone connection, the sieve insert and the dense phase conveyor are pivoted manually under the cyclone and fitted pneumatically. The separated powder collects in the lower cone part and is sucked through the open pinch valve and then transported to the sieve machine or to the powder hopper.

Consequently, a periodical extraction of powder takes place, which is regained and fed back to the powder coating circuit.

**fig. 2**
Security-operation of the delivery unit

The delivery unit is pivoted manually under the cyclone and fitted pneumatically. The appropriate operation is provided for safety reasons with a two-hand function.

fig. 3

Technical Data

<table>
<thead>
<tr>
<th>Exhaust air volume / powder application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single cyclone</strong></td>
</tr>
<tr>
<td>Exhaust air volume m³/h</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Powder removal</strong></td>
</tr>
<tr>
<td><strong>Conveying performance</strong></td>
</tr>
<tr>
<td><strong>Compressed air consumption</strong></td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
</tr>
</tbody>
</table>
Setting values/parameters

<table>
<thead>
<tr>
<th>Single cyclone</th>
<th>EZ04-12000 … EZ04-32000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinch valve control pressure</td>
<td>max. 3 bar</td>
</tr>
<tr>
<td>Conveying air pressure</td>
<td>approx. 1 bar</td>
</tr>
<tr>
<td>Transport air pressure</td>
<td>approx. 0.3 bar</td>
</tr>
<tr>
<td>Pinch valve closing time</td>
<td>6 sec.</td>
</tr>
<tr>
<td>Pinch valves opening time</td>
<td>2 sec.</td>
</tr>
<tr>
<td>Conveying air on (delayed)</td>
<td>0.7 sec.</td>
</tr>
</tbody>
</table>

Dimensions

<table>
<thead>
<tr>
<th>Single cyclone</th>
<th>EZ04-12000</th>
<th>EZ04-16000</th>
<th>EZ04-20000</th>
<th>EZ04-24000</th>
<th>EZ04-28000</th>
<th>EZ04-32000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (max.) mm</td>
<td>4848</td>
<td>5165</td>
<td>5503</td>
<td>5878</td>
<td>6545</td>
<td>7025</td>
</tr>
<tr>
<td>Weight kg</td>
<td>850</td>
<td>1020</td>
<td>1160</td>
<td>1320</td>
<td>1480</td>
<td>1710</td>
</tr>
</tbody>
</table>

Sound pressure level

| EZ04 | Normal operation | < 65 dB(A) |

The sound pressure level was measured while the unit was in operation; measurements were taken at the most frequent operator positions and at a height of 1.7 m from the ground.

The specified value is applicable only for this product itself and does not take into account external noise sources or cleaning impulses.

The sound pressure level may vary, depending on the product configuration and space constraints.
Assembly notes

Set-up and assembly

⚠️ CAUTION

Danger of injury!

The assembly procedure for setting up the cyclone must be adapted to the available resources at customer site due to heavy and bulky parts.

► Pay specially attention to the safety of the assembly personnel!
► In order to guarantee operating safety, all assembly work must be checked by trained personnel!

Above all, the following points must be observed:

– The angle between the air entry and exit can be freely selected.
– All connecting joints (exit chamber etc.) must be locked hermetically.
– It must be observed that all connecting joints in the ducting and inside the cyclone etc. are as smooth as possible, so that no powder can deposit.
– In order to ensure the grounding connection from the frame to the cyclone, a vibration damper must be bypassed with the supplied grounding cable.
– On the section point of the frame feet with their extensions, the feet must also be connected to one another. Three connection profiles are supplied for this. The fourth connection point must be left free for pivoting the delivery unit. The position can be chosen during assembly, according to local conditions.
– The monocyclone must be firmly anchored to the workshop floor.
– The ducting must be assembled as tension-free as possible.
– The delivery unit is preassembled ready and for mounting.
– For monitoring the correct position of the delivery unit, a proximity switch must be fitted on the cyclone, which gives a signal when the delivery unit is pivoted and lifted under the cyclone and releases the plant for operation.
– The transport hose must be secured with the supplied steel cable to the spring hook of the dense phase conveyor, so that no
uncontrolled movement can take place by reterve rinsing and thereby endangering personnel

- The connecting hoses of the delivery unit control and of the dense phase conveyor are to be laid out in such a way that the delivery unit can be pivoted for cleaning without disconnecting the hose connections.

- The delivery unit and the cyclone must be closed tightly during operation. The gaskets of the cyclone and of the swivel frame are to be examined regularly

---

**Space requirement for delivery unit**

Swiveling out the delivery unit needs at least 800 mm swiveling area. This place may not be closed or blocked and is used also for operation, cleaning and maintenance.

[Fig. 4]
Preparation for start-up

Important notes

**ATTENTION**

**Damage to the booth or to the ducting**

Foreign objects in the booth or in the ducting can cause damages to the plant!

► The start-up should be done only by trained personnel!

Before the start-up the following points are to be checked:

- Are all screw connections on the cyclone and on other plant units firmly tightened?
- Is the ducting and the interior of the cyclone cleaned properly?
- The tube and hose connections, are they properly connected?
- Are there no foreign objects (e.g. screws, small parts etc.) in the booth, the cyclone or the ducting?
- Is the filter unit completely assembled?
- Are all plant units grounded?
- Is the delivery unit connected correctly? Does the two-hand function (security-operation) of the delivery unit works correctly?
- Is the transport hose connected correctly on the exhaust side?
- Are the settings for the dense phase conveyor correct?

The plant may be put into operation after all these points are checked and any faults are corrected!
Dense phase conveyor

General information

The dense phase conveying is suited for the transport of the recovered powder to the powder container/hopper in the powder center. This transport principle permits a very careful and dust-free powder transport because the air requirement and the transport speed are very low.

This version with powder pump is the standard dense phase conveyor, which is normally delivered with the cyclone and the delivery unit.

fig. 5
Color change

Procedure

The following points are to be observed at color changes:

1. In order to save time and powder at a color change, the cleaning should be made in the flow direction of the powder. But cleaning the powder guns and the booth should be done first. During this phase, the powder can be transported back into the powder hopper or the powder container with the dense phase conveyor.

2. The filter unit is detached from the cyclone. By aspirating additional air on the cyclone lower part, the powder separation now is void and all resulting powder is fed to the After Filter.

3. Procedure at an extreme color change or with increased requirements:
   - Blow off the exhaust air ducting between the booth and the cyclone with compressed air.
   - Let soak in the compressed air hose without nozzle in the ducting at the air exhaust while the exhaust is operating.
   - The turbulences which are caused thereby will detach the powder in the ducting. After that, the powder is transported to the cyclone and discharged.

4. After switching off the dense phase conveyor, the transport hose is now flushed with compressed air from the exhaust side and cleaned in this way.

5. While the delivery unit is slowly being swiveled away from the cyclone, the cone of the delivery unit is blown out and the generated dust is sucked up into the cyclone.

6. Now the inside wall of the cyclone is cleaned with the air nozzle.

7. The cleaning of the immersion tube is done with a special cleaning head (see therefore "Cleaning of the connection sleeves").

8. Now the cleaning of the cyclone, the delivery unit and the ducting is completed.
Checkpoints and references

In order to guarantee a trouble-free operation, the following points should be checked regularly during an operation break:

**ATTENTION**

Scratches on the surfaces

Scratches on the surface lead to increased powder sintering and thus to increased cleaning effort.

► All cleaning work should be carried out without scratching.

<table>
<thead>
<tr>
<th>Points to check</th>
<th>Possible causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check for powder depositing in the booth and in the suction tube and clean</td>
<td>increased deposition indicates a reduction of the exhaust air and a change in the powder</td>
</tr>
<tr>
<td>Check the cyclone for powder sintering</td>
<td>increased sintering indicates increased exhaust air and changes in the powder</td>
</tr>
<tr>
<td>Check for powder depositing in the delivery unit</td>
<td>Depositing indicates higher powder development or reduced conveying performance</td>
</tr>
<tr>
<td>Check for sintering in the transport hose</td>
<td>increased sintering indicates ageing of the hose or changes in the powder</td>
</tr>
<tr>
<td>Check the cleanliness of the cyclone exterior</td>
<td>Accumulations of powder indicate leakages in the coating area</td>
</tr>
<tr>
<td>Check the grounding connections of the plant units</td>
<td></td>
</tr>
<tr>
<td>Check the gaskets of the delivery unit and the sieve insert</td>
<td>Defective gaskets greatly decrease the efficiency of the cyclone</td>
</tr>
</tbody>
</table>
Maintenance / repair of NW15 pinch valves

General specifications

− Carry out maintenance and repair work only when the control pressure has been released.
− The system must be shut off and depressurized.
− The control pressure line must be disconnected from the pinch valve.
− The power supply to the attachments (e.g. on the pressure switch) must be disconnected.
− It is important to ensure that there is not any potentially explosive atmosphere.
− Precautions must be taken (e.g. personal protective equipment) if dangerous substances may escape whilst carrying out maintenance work on the pinch valve.

General principles for the maintenance/repair of the pinch valves

Damaged sleeves, connections and joints as well as protection and safety settings must be repaired immediately or replaced with original spare parts.

The pinch valve must not be used until the proper function of the plant has been fully restored.

− Use only original assembly paste and no adhesive, grease or oil!
− Do not use any sharp or pointed objects during assembly to avoid damage to the sleeve/valve!
− Assembly aids or kits can be ordered.

Assembly aid: assembly paste MP200, order no. 1006 265

Structure of the pinch valves NW15

1 Enclosure
2 Screws
3 Socket end cover / flange
4 Pinch valve sleeve
5 Pressure zone ring
**Dismantling**

1. Place the pinch valve facing upwards and hold it tightly on the body.
2. Loosen the screws crossways with a ratchet (T30 Torx bit).
3. Then turn the pinch valve and also loosen all screws crossways.
4. Lift both socket end covers off the valve unit. Use a slot screwdriver to do this if necessary.
5. Push or pull the sleeve through the pressure zone rings out of the body.
   - This is made easier by using assembly paste (MP200) as lubrication between the sleeve and pressure zone ring.
6. Clean all individual parts afterwards and check the parts for damage as well as for ageing and porosity. Replace damaged parts.
7. Replace the body following two assemblies to ensure the thread strength.

**Assembly**

1. Slide both pressure zone rings including the sealing ring into the body.
2. Apply a thin layer of assembly paste (MP200) to the outside of one end of the sleeve.
3. Slide the coated end of the sleeve through the first pressure zone ring into the body until the sleeve through the second pressure zone ring is flush with the bottom edge of the body.

4. Apply enough assembly paste (MP200) to both ends of the sleeve and to the cone of the socket end cover.

5. Position the valve unit with one hand and hold it firmly.

6. Insert the socket end cover diagonally into the sleeve with your other hand and push in the socket end cover.

7. Align the socket end cover with the screw holes flush with the holes in the body.

8. Insert the screws into the designated holes.

9. Push and hold the socket end cover and tighten the screws crossways with a ratchet until the socket end cover is sitting on the body.
   - Check all screws have an adequate tightening torque (max. 4 Nm).

10. Turn the valve unit 180° and position it again.

11. Repeat the process for the second socket end cover.

12. Check the function of the pinch valve by closing the pinch valve with minimal control pressure. Make sure that it closes correctly to form a lip shape.

**Disposal**

Pinch valves can be recycled. The environmental guidelines in force at the operator’s location are applicable for the disposal.
Clothing the sieve mesh

It takes place according to the following steps:

⚠️ **CAUTION**

**Danger of injury!**

**Overhanging wires can cause injuries.**

- Always work with gloves on!

1. Place the Supporting ring on the workbench.
2. Lay the sieve mesh on the supporting ring (pay attention that the mesh is evenly standing out)
3. Apply the clamping ring, align the supporting ring and the clamping ring holes
4. At one hole, puncture the sieve mesh with a sharp object (e.g. awl) and screw in a screw
5. Stretch the sieve mesh on the opposite side with combination pliers, puncture the sieve mesh and insert the screw
6. Turn the sieve 90°, stretch the sieve mesh again with combination pliers, puncture the sieve mesh and insert a screw
7. Stretch the sieve mesh on the opposite side with combination pliers, puncture the sieve mesh and insert the screw
8. Stretch the sieve mesh at each intermediate hole with combination pliers, puncture the sieve mesh and insert the screw
9. Fit the additionally grounding spring with two screws
10. Cut away the surplus mesh with a sharp knife, and remove the overhanging wires with a grinding wheel

**fig. 7**

1. Supporting ring
2. Clamp ring
3. Sieve mesh
4. Grounding spring
5. Screw
In order to achieve a good sieve-performance make sure that the sieve mesh is stretched uniformly tight!

Repairing the sieve insert
Small holes in the sieve mesh can be filled with 2-components adhesive.

Monocyclone sealing
In order to achieve a good cyclone-performance it is very important that the delivery unit is tightly closed during the operation. In order to ensure a trouble-free operation, three gaskets are intended in accordance with following drawing:

![Diagram of Monocyclone sealing](image)

**fig. 8**

<table>
<thead>
<tr>
<th>Part</th>
<th>Item</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal 1</td>
<td>on the lower cyclone cone flange</td>
<td>seals between cyclone cone and sieve insert or delivery unit cone</td>
</tr>
<tr>
<td>Seal 2</td>
<td>on top of the swivel frame</td>
<td>seals between sieve insert and swivel frame</td>
</tr>
<tr>
<td>Seal 3</td>
<td>bottom of the swivel frame</td>
<td>seals between swivel frame and delivery unit cone</td>
</tr>
</tbody>
</table>

The gaskets are always to be checked during the start-up as well during the operation.
- Replace damaged gaskets immediately!
  - Leakage on the cyclone site will greatly decrease the efficiency of the cyclone, i.e. it goes more powder in the After Filter than into the recuperation.
Cleaning

Cleaning of the connection sleeves

The cleaning of the cyclone takes place with the provided cleaning wand. It is composed of two blast pipes with the following features:

Cleaning of the clean gas connecting piece

![Diagram of Clean Gas Connecting Piece]

1. Tube 1
2. Tube 2
3. Ball valve 1
4. Ball valve 2
5. Guiding plate

The blow off lance is connected to the clean gas connecting piece, tube 1 inside, tube 2 outside. By turning on the compressed air on ball valve 2, the cleaning air for the outside diameter is turned on and the clean gas pipe is blown through on the entire level at once. During the blowing
process, the lance is now conducted manually throughout the entire clean
gas pipe thus cleaning the entire connecting sleeve. Tube 1 in the inside
of the tube, prevents the blowing nozzle from being pushed off during
cleaning.

The guiding plate must be cleaned according to the same principle.

**Cleaning of the inlet connection sleeve**

By using the tube 1 and the compressed air at ball valve 1, individual
ranges in the cyclone can be blown off purposefully.

**ATTENTION**

**Risk of damaging and clogging**

It must be observed, that no cleaning agents or solvents get into
the pinch valve of the dense phase conveyor!

- The cleaning agent must evaporate completely; it must not come
  in contact with the coating powder!

<table>
<thead>
<tr>
<th>Item</th>
<th>Cleaning and/or check cycle</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collecting funnel inside</td>
<td>Daily</td>
<td>Blow off with compressed air – by using some powder types some sintering can develop, these will be cleaned with suitable cleaning agents</td>
</tr>
<tr>
<td>Cyclone cone inside</td>
<td>Daily</td>
<td>Blow off with compressed air – by using some powder types some sintering can develop, these will be cleaned with suitable cleaning agents</td>
</tr>
<tr>
<td>Cyclone outside</td>
<td>monthly</td>
<td>Clean from outside, avoid dust deposits</td>
</tr>
</tbody>
</table>

**Cleaning the sieve**

The sieve must be cleaned when the sieve meshes are clogged/dirty
because of powder agglomerations. For this purpose the sieve is to keep
immersed in solvent, until all contaminations can be removed. Thereafter
blow off the sieve and let the solvent evaporate for approx. 1 day, until the
sieve is dried completely. It must be observed, that solvent must not come
in contact with the coating powder!
Cyclone cleaning granules

Order number: 269 115
Delivery unit: 4 kg

- The solid powder agglomerations inside the Cyclone can be removed with the aid of these Cleaning granules.
- Each cleansing process requires approximately 4 kg (8.82 lb = one delivery unit). Depending on how it is interspersed with powder, the granules can be reused for several cleaning processes.
- It is recommended to clean the cyclone once a month.
- The cleaning granules must be stored in a cool, dry space.
- It is advisable to adhere to the following cleaning procedure:

Avoid heat, sparks etc. during all work!

1. Switch off the exhaust air
2. Swivel the delivery unit, and the sieve unit to the side
3. Seal up the delivery unit opening (to the pinch valve)
4. Switch off the dense phase conveyor
5. Pour 4 kg (8.82 lb) cleaning granules into the delivery unit funnel
6. Close the delivery unit while the sieve insert remains swiveled to the side
7. Switch on the exhaust air
   - The turbulences which are caused thereby will start the cleansing process.
   - The cleaning procedure can take 30 minutes to several hours, depending on the level of sintering.
8. Switch off the exhaust air
9. Swivel the delivery unit to the side as soon as the air flow is slowed down
   - If the delivery unit is opened untimely, the cleaning granules are sucked up into the After filter!
10. Check the cleaning result
    - If the cleansing process should go on, then switch the plant on according to point 6
11. Remove the granules from the delivery unit (e.g. with a small shovel)
    - Depending on how it is interspersed with powder, the granules can be reused again
12. Clean the cyclone and the delivery unit thoroughly
13. Open the delivery unit opening in the pinch valve and switch on the dense phase conveyor
14. Swivel in the sieve insert and the delivery unit, and close the delivery unit
15. The plant is now ready for operation
Decommissioning, storage

Introduction

Safety rules
Suitable equipment (e.g. a crane) must be used when moving parts that are sometimes bulky and heavy.
Components being disassembled must be adequately secured before they are detached.

Requirements on personnel carrying out the work
Use only technical personnel who are trained in operating the respective equipment (e.g. a crane).
If there are any uncertainties, please contact Gema Switzerland GmbH.

Storage conditions

Storage duration
The cyclone unit can be stored indefinitely, so long as corrosion protection is assured, see regulations/standards.
Store the pinch valve and the spare sleeves dry, dust-free and protected against ultraviolet radiation at room temperature. As the storage time increases, the technical properties of the sleeves deteriorate.

Space requirements
The space requirements correspond to the size of the components plus the packaging.
The load-bearing capacity of the floor should be at least 200 kg/m².
There are no special requirements concerning distance to neighboring equipment.
**Physical requirements**

Storage must be inside a dry building at a temperature between +5 – 60 °C.

**Regulations/standards**

For storage and transport:

- A desiccant bag (silica gel) approx. 300 g (8 units/bag, DIN 55473) must be placed in all ducting and cyclones.
- These bags must not be placed directly onto the steel surface, i.e. place plastic film or styrofoam underneath and, if necessary, stick the bag to the plastic film.

- Cyclone < 22 000 m³/h: 3 bags
- Cyclone > 22 000 m³/h: 4 bags
- Tube < 3 m: 1 bag
- Tube > 3 m: 2 bags

Long-term storage periods (> 4 months) or for sea freight transport

- Only spray cyclones with Panolin ARC fluid W 25.
- All openings of the ducting and cyclones must be sealed with PE film (at least 120 µm thick) or VCI film (Cortec VCI-126 quality) in order to prevent external air and ambient influences. Affix and seal this film with stretch film (approx. 100 mm wide).

**Hazard notes**

The safety data sheets of the corrosion protection agent used must be observed.

There is no danger to personnel or the environment if the unit is stored properly.
Shut-down

Decommissioning
Before starting any kind of work, the whole plant must be disconnected from the supply (current/compressed air).

The fire suppression components connected to the cyclone/ducting are to be dismantled/removed according to the instructions of the fire detection system supplier.

Cleaning
Remove the contamination from the outside of all components.
The cyclone and ducting must be thoroughly cleaned internally of sintering and contamination.

Preservation
Ensure corrosion protection in accordance with section "Regulations and standards".

Disassembly/attachment of transport safety devices

Storage in upright position:
1. Secure moving parts of the delivery unit
2. Secure the delivery unit to the cyclone frame, or remove the delivery unit and pack it separately
3. To save space, the delivery unit and the lower part of the cyclone frame (yellow) can be removed and packed separately. When lifting, observe the instructions in the "Transport" section.

Storage in horizontal position:
The cyclone assembly must be disassembled into its individual parts.
1. Remove the delivery unit
2. Remove the cone insert
3. Remove the exit chamber
4. Remove the cyclone frame
5. Put aside cyclone cylinder

Packing
A suitably stable pallet, big enough, must be used. To prevent damage to the components, collisions with other parts must be prevented.

It is definitely not recommended to stack the individual parts! Should this nonetheless be planned, the packaging must be made robust enough to protect the cyclone parts against additional forces.
Identification

Apply the label "Protect from dampness and moisture" on the product and the packaging.

Maintenance during storage

Maintenance schedule

For longer storage periods (> 1 year) check the anti-corrosion measures periodically.

Maintenance works

If any deficiencies in the anti-corrosion protection measures are found, these must be eliminated.

Return to service

Removing the preservation

All ducting and cyclones must be cleaned internally i.e. free of grease, oil and dust (bath cleaning, thinner cleaning or "Kärcher" hot/steam cleaning).
Packing, transport

Introduction

This chapter describes special precautions that must be taken during internal transport of the product if:

– the customer himself must pack, transport and ship the product, such as to have renovations or service work carried out by the manufacturer

or

– the product must be shipped for disposal (recycling).

Safety rules

Suitable equipment (e.g. a crane) must be used when moving parts that are sometimes bulky and heavy.

Components being disassembled must be adequately secured before they are detached.

Requirements on personnel carrying out the work

Use only technical personnel who are trained in operating the respective equipment (e.g. a crane).

If there are any uncertainties, please contact Gema Switzerland GmbH.

Packing material

Not necessary for the internal transport. For external transport see "Storage".

Transport

Data concerning goods to be transported

– The space requirements correspond to the size of the components plus the packaging
– Weight see "Technical Data"
– Points of attachment, see "Mode of transportation"
Mode of transportation

For short distances/relocations within the same room, the cyclone must be transported suspended (e.g. using a crane).

**ATTENTION**

Risk of damage

The center of gravity can be above the attachment point.

- Tighten straps etc. only to cyclone frame!
- Use the attachment points on the upper part of the cyclone exclusively for disassembly!

**fig. 10**

For longer distances or through doors which require a horizontal position of the cyclone body, disassembly of the cyclone is required (see section "Storage").

**ATTENTION**

Risk of damage

The cyclone must not be placed fully in the horizontal position, since it is not designed for this purpose.

- In case of doubt contact Gema Switzerland GmbH!

Loading, transferring the load, unloading

Suitable lifting equipment is to be used for all procedures.
## Troubleshooting guide

### Problem fixing

<table>
<thead>
<tr>
<th>Problem/error/ malfunction</th>
<th>Cause</th>
<th>Procedures/remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant cannot be put into operation</td>
<td>The signal from the delivery unit is not present</td>
<td>Connect the delivery unit to the cyclone correctly</td>
</tr>
<tr>
<td>Too little exhaust air in the booth</td>
<td>Ducting booth/cyclone or cyclone/After Filter not leak-proof</td>
<td>Search and repair the leak(s)</td>
</tr>
<tr>
<td></td>
<td>Delivery unit not connected to the cyclone</td>
<td>Connect the delivery unit to the cyclone correctly</td>
</tr>
<tr>
<td>Contamination on the cyclone external wall</td>
<td>Connection points leaking</td>
<td>reseal</td>
</tr>
<tr>
<td>Powder sintering in the cyclone</td>
<td>Quick reacting powder quality</td>
<td>Check the room temperature</td>
</tr>
<tr>
<td></td>
<td>Air speed too high</td>
<td>Check the air volume</td>
</tr>
<tr>
<td></td>
<td>Solvents came in contact with powder</td>
<td>Clean the cyclone</td>
</tr>
<tr>
<td>Powder remains in the delivery unit</td>
<td>Powder accumulation in the cyclone too large</td>
<td>Check the conveying performance</td>
</tr>
<tr>
<td></td>
<td>Settings of the dense phase conveyor not correct</td>
<td>Check setting values / parameters according to technical data</td>
</tr>
<tr>
<td>Continual heavy dust generation at the exit of the transport hose</td>
<td>Spiral air is set too high</td>
<td>Guide value approx. 0.3 bar</td>
</tr>
<tr>
<td>Strong dust generation at the exit of the transport hose during conveying</td>
<td>Conveying air set too high</td>
<td>Guide value approx. 1 bar</td>
</tr>
<tr>
<td>Problem/error malfunction</td>
<td>Cause</td>
<td>Procedures/remedy</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------</td>
<td>-------------------</td>
</tr>
</tbody>
</table>
| too much powder in the After Filter | Sieve clogged up | Clean the sieve  
Check the powder removal  
Check the seals on the cyclone and the delivery unit  
Check the air volume |
| Pinch valve does not close or not fully close | No control air present | Check compressed air lines |
|  | Control valve defective | Check if control air is present on pinch valve |
|  | Control pressure too low | Check/replace control valve |
|  | Sleeve defective | Check ideal control pressure to be set |
| Pinch valve does not open or not fully open | Bleed bore on control valve clogged | Clean silencer/control air line |
|  | Control valve defective (does not switch) | Check/replace control valve |
| Sleeve wears out quickly | Excessive control pressure/differential pressure | Check ideal control pressure to be set |
|  | Switching (open/closed) too fast | Increase switching time |
|  | Turbulence in the conveying line/pinch valve too close to an elbow | Change conveying line or arrangement of pinch valve (minimum distance to elbow) |
|  | Pinch valve does not fully close | Check ideal control pressure to be set |
|  | Unfavorable operating conditions (e.g. excessive temperature, operating pressure or flow speed) | Change operating conditions |
|  | Sleeve quality not suitable for pumping medium | Use different sleeve quality |
Spare parts list

Ordering spare parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

– Type and serial number of your powder coating equipment
– Order number, quantity and description of each spare part

Example:
– Type OptiGun GA03 automatic powder gun
  Serial number 1234 5678
– Order no. 203 386, 1 piece, Clamp – Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this bulk stock is always marked with an *

Wearing parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:
Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

ATTENTION

Use of non-original Gema spare parts

When using the spare parts from other manufacturers the explosion protection is no longer guaranteed. If any damage is caused by this use all guarantee claims become invalid!

– Only original Gema spare parts should be used!
### Delivery unit

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sealing ring – Ø 42/55x2 mm</td>
<td>267 686</td>
</tr>
<tr>
<td>Clamping piece – Ø 40 mm</td>
<td>355 291</td>
</tr>
<tr>
<td>Counter plate</td>
<td>392 405</td>
</tr>
<tr>
<td>Snap ring – I45</td>
<td>256 420</td>
</tr>
<tr>
<td>Allen grub screw – M6x10 mm</td>
<td>234 931</td>
</tr>
<tr>
<td>Dense phase conveyor – complete (see &quot;Powder transport&quot;)</td>
<td></td>
</tr>
<tr>
<td>Sieve insert – complete (see &quot;Sieve insert&quot;)</td>
<td></td>
</tr>
<tr>
<td>Foam rubber profile – 40x10 mm (indicate cyclone size/-type!)</td>
<td>105 163*</td>
</tr>
<tr>
<td>Foam rubber profile – 30x10 mm (indicate cyclone size/-type!)</td>
<td>100 870*</td>
</tr>
</tbody>
</table>

* Please indicate length

---

For all other electric and pneumatic components, see also the Spare parts list in the enclosed wiring or pneumatic diagram!
# Sieve insert

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supporting ring</td>
<td>392 472</td>
</tr>
<tr>
<td>2</td>
<td>Clamp ring</td>
<td>392 480</td>
</tr>
<tr>
<td>3</td>
<td>Sieve mesh – 600 μm</td>
<td>105 180#</td>
</tr>
<tr>
<td>3.1</td>
<td>Sieve mesh – 400 μm</td>
<td>105 171#</td>
</tr>
<tr>
<td>3.2</td>
<td>Sieve mesh – 2000 μm</td>
<td>1012 798#</td>
</tr>
<tr>
<td>4</td>
<td>Grounding spring</td>
<td>392 464</td>
</tr>
<tr>
<td>4.1</td>
<td>Grounding spring</td>
<td>1012 797</td>
</tr>
<tr>
<td>5</td>
<td>Screw</td>
<td>248 568</td>
</tr>
<tr>
<td>5.1</td>
<td>Screw</td>
<td>1012 796</td>
</tr>
</tbody>
</table>

# Wearing part
## Powder transport

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Powder hose – dia. 16/23 mm</td>
<td>1010 040#*</td>
</tr>
<tr>
<td>3</td>
<td>Hose clamp – 17-25 mm</td>
<td>223 085</td>
</tr>
<tr>
<td>4</td>
<td>OptiFeed PP06 Powder pump – see corresponding operating manual</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Plastic tube – Ø 6/4 mm</td>
<td>103 144*</td>
</tr>
<tr>
<td>6</td>
<td>GEKA coupling with grommet – Ø 16 mm</td>
<td>1003 872</td>
</tr>
<tr>
<td>7</td>
<td>Fluidizing unit – complete, see corresponding spare parts list</td>
<td>1005 507#</td>
</tr>
<tr>
<td>8</td>
<td>Allen cylinder screw – M8x20 mm</td>
<td>265 241</td>
</tr>
<tr>
<td>9</td>
<td>Gasket</td>
<td>395 439</td>
</tr>
<tr>
<td>10</td>
<td>Hexagon shakeproof nut – M8</td>
<td>244 449</td>
</tr>
</tbody>
</table>

# Wearing part
# Powder transport connection

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Part Number</th>
<th>Quantity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder transport connection – complete (pos. 1-13, incl. fixing screws)</td>
<td>1008 846</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Funnel piece</td>
<td>1005 502</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Gasket for pos. 1</td>
<td>395 439#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluidizing unit – complete (pos. 2-6)</td>
<td>1005 507</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Connector</td>
<td>1005 504</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluidizing tube set (incl. pos. 3, 4, 5)</td>
<td>720 006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Fluidizing tube</td>
<td>1005 505#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 O-ring – Ø 17x3 mm</td>
<td>242 489#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 O-ring – Ø 26x2 mm</td>
<td>246 549#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Locking piece</td>
<td>1005 506</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Connecting piece</td>
<td>1005 503</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 GEKA coupling – 1”-IG</td>
<td>1000 854</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Pinch valve DN15 – complete, incl. pos. 9.1</td>
<td>1006 255</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1 Pinch valve sleeve NW15</td>
<td>1006 256#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Elbow joint – 1/8”-dia. 8 mm</td>
<td>224 359</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Throttle valve – 1/8”-1/8”</td>
<td>1002 127</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Double nipple – 1/4”-1/8”</td>
<td>242 209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Inline regulator – 3 bar, 1/4”</td>
<td>1005 517</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Wearing part

![Diagram](image)